

III.—On a Collection of Reptiles and Amphibians from Mt. Murud, Borneo. By

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(With one plate.)

The collection of reptiles and amphibians made by Dr. Mjöberg is a valuable contribution to the mountain fauna of Borneo. Although only 14 species were obtained, no less than five of them appear new to science. All were caught at high altitudes—between 5500 and 7000 feet.

The discovery of a new lizard allied to *Phoxophrys* is of particular note, whilst an interesting adaptation to environment was met with in respect to the breeding habits of a new tree-frog of the genus *Philautus*. I am also, thanks to a large series of specimens, able to give the true status of the frog originally described by Boulenger as *Microhyla leucostigma*.

The types of the new species here described have been presented by the Sarawak Museum to the British Museum.

SNAKES.

1. *NATRIX MURUDENSIS* sp. nov.

Type female, author's number 7210 collected at 5500—6000 feet altitude.

Description of the type. Maxillary teeth 23, the last 2 abruptly enlarged. Eye moderate. Rostral broader than high, just visible above; internasals as long as the prefrontals, broadly truncate anteriorly; frontal nearly as broad as long, as long as its distance from the rostral, much shorter than the parietals; nostril in a partly divided nasal; loreal longer than high; 1 prae- and 3 postoculars; temporals 1+2; 9 supralabials, fourth to sixth touching the eye; 11 lower labials, 6 in contact with the anterior chin-shields, which are a little longer than the posterior.

Sar. Mus. Journ., No. 8, 1925.

Scales in 19 rows, reducing to 15 before the vent, all strongly keeled except those of the outer row which are only feebly keeled. Ventrals 179, anal divided, subcaudals 63 pairs (tail incomplete).

Colour. Dark olive brown above with a chain of small yellow spots down either side of the back in the posterior two-thirds of the body; neck with reddish and black markings; upper lip, chin and throat yellow; belly greyish-yellow, with longitudinal chains of small black spots; tail below dark grey.

A second female (No. 7209) captured at 7000 feet has the internasals slightly shorter than the praefrontals, a slightly narrower frontal, and on the left side 2 praecocular shields; ventrals 176, caudals 83. The ventral spots are confined to a chain on either side of the belly.

Natrix murudensis is closely related to *N. chrysarga* Schlegel from which it differs in the fewer number of maxillary teeth and in having only a single anterior temporal shield. *N. chrysarga* is a common and widely distributed snake ranging from the E. Himalayas and S. China to the Malay Archipelago, and as far as I am aware two anterior temporals is a constant character. The number of teeth in the maxillary bone in continental specimens varies from 33 to 37, not counting the two enlarged posterior teeth. I have not examined the dentition of any from the Malay Archipelago.

2. *NATRIX SARAWACENSIS* Gunther.

Tropidonotus sarawacensis, De Rooij, Rept. Indo-Austr. Archipel., ii, 1917, p. 85.

One example from near the top of the mountain.

LIZARDS.

3. *GYMNODACTYLUS BALUENSIS* Mocq.

De Rooij, Rept. Indo-Austr. Archipel., 1915, p. 14.

Three specimens were collected at between 4500 and 6000 feet. One is an adult male measuring 94 mm. from snout to vent. It has an angular series of 9 praeanal pores and 9 femoral pores on either side, with 9 and 10 upper and 8 and 10 lower labials. The other two examples are half grown and in them the femoral scales bear pits only.

The juveniles are coloured light brown above with black spots forming irregular cross-bars. The adult is pale grey in colour and has the markings much paler.

4. *GONOCEPHALUS MJÖBERGI* sp. nov. Pl. fig. 2.

Type female, author's number 7211, collected at 7000 feet altitude:

Description. Snout longer than the orbit; canthus rostralis sharp; supraciliary border not strongly raised; tympanum as large as the eye opening; nostril in a single large scale; upper head shields moderate in size, irregular, feebly keeled; a horizontal ridge composed of one or two keeled scales above and in front of the tympanum; 8 and 9 upper and 8 lower labials; a series of 5 or 6 large flat scales parallel to the infralabials and separated from them by two rows of smaller scales; a single, enlarged, flat scale, two-thirds the size of the tympanum, and just below it; gular sac small (the tip missing), with feebly serrated edge, covered with small, smooth scales.

Nuchal crest formed of 11 lanceolate scales, the anterior small, the longest equal to the diameter of the eye; dorsal crest a mere ridge, not continuous with the nuchal. Dorsal scales small, feebly keeled, their points directed upwards and backwards and intermixed with larger scales arranged in oblique series; ventral scales larger than the dorsals, keeled.

Tail compressed, 3 times as long as the head and body, covered with large, feebly keeled scales above and 4 rows of larger, more strongly keeled scales, below. Limbs with moderately large, keeled scales; the fore-limb pressed backwards along the body reaches the vent; the hind-limb pressed forwards reaches to just beyond the eye; third and fourth fingers equal, fourth toe a little longer than third.

Colour: Greyish-blue (grass-green in life) above, paler below.

From snout to vent 88 mm.; tail 265; fore-limb 57; hind-limb 76.

Allied to *G. dilophus* (Dum. & Bib.) and *G. grandis* (Gray).

5. *PHOXOPHRYS SPINICEPS* sp. nov. Pl. fig. 1.

Type female, author's number 7212, collected at about 6000 feet altitude.

Description. Snout short, shorter than the length of the orbit; canthus rostralis with raised edge; upper head scales moderate in size, unequal, strongly keeled, a **Λ**-shaped series on the forehead. A long spine above the eye succeeded by a much shorter one at the posterior margin of the supraciliary border; other scattered conical scales on the hinder

part of the head and a prominent spine upon the occiput; 11 upper and 11 lower labials and three or four rows of enlarged scales parallel with the latter.

An oblique fold in front of the shoulder. No nuchal crest but three well separated spines on the neck, and groups of three or four spinous scales at intervals down the middle of the back and on to the base of the tail. Upper part of the body covered with very small, smooth imbricate scales with rounded edges, internixed with enlarged, pointed, keeled scales, all directed upwards and backwards, the larger ones arranged in more or less oblique series and conterminous with the enlarged vertebral scales; ventral scales very large and strongly keeled; gular scales much smaller, feebly keeled; limbs covered with large, irregular, keeled scales.

Tail twice the length of the head and body, compressed laterally, covered with large keeled scales, those below larger than those above. Fourth finger a little longer than third, fourth toe much longer than third, the hind-limb reaches to the tip of the snout.

Colour. Pale grey above (grey-green in life) with scattered dark brown markings; the fold in front of the shoulder black. Throat with transverse black lines; belly spotted with grey.

From snout to vent 60 mm.; tail 123; fore-limb 37; hind-limb 58.

The affinities of this interesting lizard are more with the unique *Phoxophrys tuberculata* Hubrecht than with *Japalura*, and I have therefore placed it in the former genus.

The single example was captured on a tree trunk. It contained two oval eggs about 12 × 7 mm.

6. SPHENOMORPHUS MURUDENSIS, sp. nov.

Type, author's number 7221, collected on the top of the mountain (7000—7200 feet).

Description of the type. Lower eyelid scaly, tympanum large, two-thirds the size of the eye-opening, no lobules; snout rounded, no supranasals, nostril in a single shield; rostral convex, in contact with the fronto-nasal, which is broader than long; praefrontals in contact; frontal as long as the frontoparietals and interparietal together, in contact with three supraoculars; 6 supraoculars, the last very small; 8 supraciliaries; a small shield behind the interparietal, separating

the parietals; 2 anterior and 2 posterior loreals; 6 supralabials, the fourth below the middle of the eye; temporal shields scale-like but larger than the body scales, the largest being in contact with the parietal; no nuchals.

Distance between the axilla and groin $1\frac{2}{3}$ times the distance between the snout and fore-limb; 30 smooth scales round the middle of the body, dorsals and laterals subequal, ventrals slightly larger; praeanales enlarged. Tail $1\frac{3}{4}$ times as long as the head and body, the scales below transversely enlarged; the hind-limb nearly reaches the wrist; fourth toe much longer than third with 16 rounded lamellae beneath.

Colour. Dark brown on the back thickly spotted with black; a dark flank band of closely packed black spots on a white ground, the spots becoming thinned out as they approach the belly which is white with numerous black spots. Tail brown above, white below, thickly spotted all over with black.

From snout to vent 50 mm.; tail 89; fore-limb 13; hind-limb 19.

Allied to *S. anomalopus* Bouleng., and *S. variegatus* Peters.

Variation. A second specimen (No. 7220) taken lower upon the mountain, 5000—6300 feet, differs in that there is a small shield interposed between the praefrontals, and there are 32 scales round the body.

To this species also I refer two more specimens collected at about 6000 feet altitude (Nos. 7217 and 7218). Their limbs are slightly longer, the foot reaching to just beyond the wrist when the limbs are adpressed and their colouration is somewhat different. The back is brown, with only a few black spots upon it; there is a well defined black lateral band and the flank below it is only thinly spotted; the rest of the lower parts are pure white. The colouration of these two lizards on the whole, is in distinct contrast to that of the former two, but in the absence of differential scale characters I have placed them under the same name.

AMPHIBIANS.

7. *RANA KUHLII* Schleg.

Van Kampen, Amphib. Indo-Austral. Archip., 1923, p. 178.

Two examples were collected at 6000 feet.

8. *PHILAUTUS PETERSI* Bouleng.

Ixalus petersi Boulenger, P. Z. S. London, 1900, p. 185, fig.

Philautus petersi, Van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 276.

Ixalus castanomerus Boulenger, Journ. F.M.S. Mus. 1905, i, p. 39, fig.—id. Rept. and Batr. Malay Penin. 1912, p. 254.—Malc. Smith, Journ. F.M.S. Mus. 1922, X, p. 280.

12 examples from near the top of the mountain. *Philautus petersi* was described by Boulenger on specimens from Borneo (Mt. Penrissen, Mt. Dulit and Mt. Kinabalu) and Great Natuna. He distinguished it from *Ph. aurifasciatus* (Schlegel) by the larger and more distinct tympanum, the longer digits and duller colouration. Van Kampen in recently discussing these two forms (1923, l.c.s.) remarks that "the size of the tympanum and the colouration, however, are very variable in *Ph. aurifasciatus* and therefore the differences between the two species are very slight, if at all present. Perhaps the shape of the snout and the position of the nostrils are more valuable characters in distinguishing both species." With these remarks I fully agree. The difference between the two forms is certainly very small but with a good series of the frog from one of the type localities (Mt. Penrissen) available and some examples of *aurifasciatus* from Java, I maintain Boulenger's separation, on the following grounds:—

<i>Ph. petersi.</i>	<i>Ph. aurifasciatus.</i>
Snout more pointed, canthus rostralis more prominent and convergent anteriorly towards its fellow.	Snout less pointed, canthus rostralis less prominent and less convergent towards its fellow.
Interorbital space not broader than upper eyelid.	Interorbital space usually broader than upper eyelid.
Heel to tip of snout or beyond.	Heel to between nostril and tip of snout.
Length of head and body 40 mm.	Length of head and body 31 mm.

If, however, Boulenger is right in distinguishing the Bornean from the Javan frog, I do not concur in his separation of *Ph. castanomerus* (type locality Selangor, Malay Peninsula) from *Ph. petersi*. The only difference in the descriptions of the two species is a slight one in respect to the size of the digital discs as compared with the tympanum, while specimens in my collection from the Cameron Highlands on the Pahang-Selangor boundary agree with the Bornean examples in every particular.

The eggs of this frog are few and very large, being 5 mm. in diameter in a specimen 30 mm. from snout to vent.

9. *PHILAUTUS MJÖBERGI*, sp. nov. Pl. fig. 3.

Type, author's number 7265, collected at 7000 feet in November, 1922.

Description of the type. Choanae small, oval, partly hidden by the edge of the jaw. Head large, much broader than long, broader than the width of the body, snout rounded; eye prominent, nearly as long as the snout; canthus rostralis sharply defined; loreal region oblique, concave; nostril very near the tip of the snout; interorbital region $1\frac{1}{2}$ times as broad as the upper eyelid; tympanum indistinct, half the width of the eye, its distance from it equal to its own diameter.

Fingers long, free, but with a fine dermal fringe extending along their lateral edges to the disc; first much shorter than second which is two-thirds the length of the third; discs large, as broad as long, that of the third larger than the tympanum. Toes one-third webbed, their discs scarcely smaller than those of the fingers; subarticular tubercles moderate, an oval inner metatarsal tubercle one-third the length of the inner toe, no outer tubercle; the tibio-tarsal articulation reaches to well beyond the snout.

Skin of the upper parts quite smooth, of the throat finely, of the belly coarsely, granular; no fringe along the outer edge of the arm or leg.

Colour. Dark reddish-brown above and on the sides with blackish markings, including a) (-shaped mark in the middle of the back. Throat brown, belly dark brown with large white irregularly shaped spots. Two or three large white oval spots in the groin; limbs indistinctly barred.

Ph. mjobergi is related to *Ph. vermiculatus*, from the Malay Peninsula, from which it differs in the longer leg and shorter web to the toes and, very distinct, in colouration.

Variation. Over 50 specimens were collected, all from the higher parts of the mountain; they show the following variations. The tympanum may be only one-third the diameter of the eye, the interorbital region no broader than the upper eyelid. The tibio-tarsal articulation usually reaches to well beyond the tip of the snout, but may extend only to the tip.

Most of the specimens are coloured like the type, and one or two or more white spots in the groin or flanks are constantly present. Some individuals are greyish-brown in colour mottled with darker. Juveniles are usually paler in colouration.

Measurements of *Ph. mjobergi* in mm.

No.	7265	7297	7266
Snout to vent	30	28	23
Length of head	11	10.5	8.5
Breadth of head	14	13	11
Fore-limb	26	21	15
Hand	11	11	7.5
Hind-limb	54	50	40
Foot	14	14	11
Sex	♀	♀	♂

Many of the females collected are filled with ripe ova. These are few in number and extremely large. In one specimen, 26 mm. from snout to vent, from which I extracted 9 eggs, the vitelline sphere measures between 3 and 3.5 mm. in diameter, whilst in another female an egg which had been extruded, and preserved intact with its surrounding gelatinous envelope, measures 9.5 mm. in diameter.

Dr. Mjöberg states that these frogs were found depositing their eggs and breeding in the pitchers of the Pitcher plants (*Nepenthes*), no other water being available for the purpose. Unfortunately he obtained no larvae, and the very large size of the eggs would appear to indicate that a considerable part of the larval development, at any rate, was carried on away from water.

10. SPHENOPHRYNE LEUCOSTIGMA.

Microhyla leucostigma Boulenger, Ann. Mag. Nat. Hist., 1899, (7) iii, p. 275, fig.—idem., Fauna Malay Penin., Rept. and Batr., 1912, p. 260.—S. Flower, P. Z. S., London, 1899, p. 905.—A. L. Butler, Journ. N. H. S. Bombay, 1904, xv, p. 388.

Chaperina fusca Mocquard, Mém. Soc. Zool. France, 1892, V, p. 194, figs.—(? in part), Van Kampen, Amphib. Indo-Austr. Archip., 1923, p. 109.

Chaperina beyeri Taylor, Philippine Amphibia, 1920, p. 333, fig.

Nectophryne picturata Malc. Smith, Journ. F.M.S. Mus., 1921, x, p. 197, fig.

I have given in full what I believe to be the correct synonymy of this most interesting little amphibian, originally described from specimens obtained in the Larut hills by Stanley Flower. I have for comparison 9 specimens from Kuching, N. Borneo, 3 specimens from Mt. Murud, collected at 6000 feet, 3 specimens from the Larut hills, Perak, Malay Peninsula (one of them one of the types), 4 specimens of *Chaperina beyeri* Taylor from Jolo, Philippine Islands, sent me by the author.

I have dissected the pectoral girdle of a Kuching specimen and of one from the Larut hills; they have slender but well defined clavicles and are therefore rightly placed under *Sphenophryne* instead of *Microhyla*.

Taylor has separated his *Chaperina beyeri* from *Chaperina fusca* on the presence of a soft dermal spine on the heel and on the absence of tympanum. This latter is feebly distinct in two of the Kuching examples but is absent in all the rest. The spine is present in all 19 examples, both on the heels and elbows, and M. Angel, who has kindly examined the type specimen of *Chaperina fusca* for me, tells me that it is present also on all four limbs. It varies in size from a mere projection, hardly visible under the glass, to a fine spicule one millimetre in length; being semi-translucent it is not visible in all lights and thus has escaped notice.

As regards colouration, all the Kuching examples are coloured like the Perak specimens, a very complete description of which has been given by Flower. Those from Mt. Murud are dark purplish-black above with the small white spots almost absent on the dorsum but more numerous on the sides of the head and body. Taylor also records variations in colour for his Philippine specimens.

The occurrence of this frog in New Guinea, if V. Mehely's frog really is identical with it, is remarkable, for up till now no amphibian inhabiting that island has been found also in the Malay Peninsula.

11. NECTOPHRYNE GUENTHERI Bouleng.

Van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 68.

4 specimens from between 5500 and 7000 feet altitude.

12. *NECTOPHRYNE MISERA* Mocq.

Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 66.

Many specimens from near the top of the mountain. The largest measures 23 mm. from snout to vent.

13. *MEGALOPHRYS HASSELTII* Tschudi.

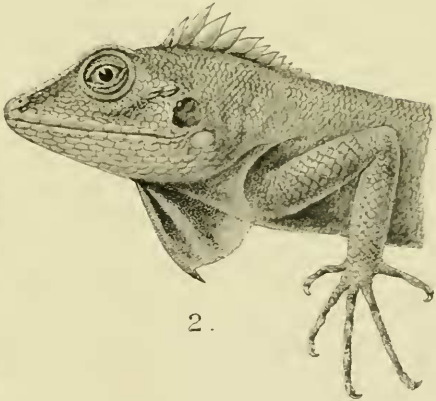
Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 13.

Two examples were collected at 6000 feet.

14. *MEGALOPHRYS GRACILIS* Gunther.

Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 15.

One example was collected at 7000 feet.



J. Green del.

NEW REPTILES & BATRACHIANS FROM MT. MURUD.

1. *Phoxophrys spiniceps*. 2. *Gonocephalus njobergi*.
3. *Philautus njobergi*.